

Sub
E

a mounting structure supporting the tip and tapered structure;

the contact structure is bilaterally symmetric with a generally obtuse included angle of the tapered structure.

52. A replaceable cutting element as set forth in claim 51, including an engagable structure for removal of the element.

53. A cutting element as in claim 51, wherein a portion of the tip structure is harder than 92 on the Rockwell A Scale and an outer portion of the tapered structure is softer than 92 on the Rockwell A Scale.

54. A cutting element as in claim 51, wherein the tapered structure is generally conical.

55. A cutting element as in claim 51, wherein the tip structure comprises a point.

56. A cutting element as in claim 51, including an engagable structure comprising:

a non-cylindrical surface suitable for the engagement of an extraction tool.

57. A cutting element as set forth in claim 51, including:

a conical helical screw thread on the mounting structure concentric with the contact structure of the element.

58. A cutting element as in claim 51, wherein at least a portion of said tip structure is fabricated from one of a group of materials comprising diamond, a nitride of a metallic element, a carbide of a metallic element, an oxide of a metallic element carbide, a boride of at least one metallic element, a silicide of a metallic element, and carbon nitride.

SB
EI

59. An elongated self-locking replaceable cutting element suitable for use on the body of a rotary earth-boring bit, the element comprising:

a contact structure comprising a cutting tip structure,

a mounting structure carrying the contact structure and

a conical helical screw thread on the mounting structure wherein:

the cutting tip structure and the mounting structure are formed generally along the same axis and,

a portion of said cutting tip structure is generally bilaterally symmetrical in at least three equally spaced radial directions from the axis of the element.

60. A cutting element as claimed in claim 59, wherein the included angle of the conical helix is between 20° and 60°.

61. A self-sharpening rotatable cutting element suitable for use on the body of an earth-boring drag bit, the element comprising:

a contact structure including a cutting tip structure and a cutting tapered structure formed generally along the same axis,

a mounting structure carrying said cutting tip and tapered structure,

a non-cylindrical structure for the engagement and removal of the element,

a first material of wear resistance on the cutting tip and,

a second region of material of a second wear resistance on the tapered structure wherein:

the wear resistance of said first material is greater than the wear resistance of said second material,

said tapered structure generally converges with said tip structure and

Sb
G2

C

a portion of said first material is generally contained within said second material,
a portion of the mounting structure is generally symmetrical in at least three
equally spaced radial directions.

the axis of the mounting structure is generally aligned with the axis of the tapered
structure.

62. A cutting element as in claim 61, wherein said first material is in the form of
a column positioned on the axis of the contact structure.

63. A cutting element as in claim 61 wherein the cross-sectioned area of said
material of first hardness is less than 10% and more than 5% of the total cross-sectioned
areas of the contact structure.

64. A cutting element as in claim 61, wherein the material of wear resistance on
the tapered structure is at least 300 points softer than the wear resistant material of the
cutting tip.

REMARKS

Regarding the Paragraph 3 rejection under Section 112, Claims 6, 7, 11-15, 20-25,
35, 36, 38, and 41 have all been cancelled.

The insufficient antecedent basis in Claims 6 and 7 have been noted and that
wording is not included in any of the newly submitted claims. The wording in Claim 11
"the total length of the cutting element", has also been eliminated from the newly submitted
claims. The insufficient antecedent basis rejections in Claims 36 and 38 have also been
noted and are not included in the newly submitted claims.

Regarding Paragraph 5, wherein Claims 1-7, 10, 11-15, and 20-25, which were
rejected under Section 35, U.S.C. 102(b) as being anticipated by Kniff is respectfully